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The above-mentioned scientific conference on Hemorrhagic Fever with Renal Syndrome (HFRS), Hantavirus Pulmonary Syndrome (HPS) and Hantavirus has gathered scientists to review the situation of Hantavirus diseases in the world and control strategies

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THE FIFTH INTERNATIONAL CONFERENCE

on

HEMORRHAGIC FEVER WITH RENAL SYNDROME (HFRS), HANTAVIRUS PULMONARY SYNDROME (HPS) AND HANTAVIRUSES

13-16 June, 2001

Organized by the Fondation Mérieux
With the International Association for Hantaviruses

Les Pensières
Veyrier-du-Lac (French Alps)

FINAL REPORT

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The Fifth International Conference on:

Hemorrhagic Fever with Renal Syndrome (HFRS), Hantavirus Pulmonary Syndrome (HPS) and Hantaviruses - 13-16June 2001 Veyrier du Lac France

Conference Summary

The "Fifth International Conference on Hemorrhagic Fever with Renal Syndrome, Hantavirus Pulmonary Syndrome, and Hantaviruses" was held 13-16 June 2001 in Annecy, a scenic resort in the French Alps. The conference, with 160 participants, was co-organized and generously hosted by the Mérieux Foundation.

Apart from Eurasia and the Americas, evidence for infections with hantaviruses now has been reported from many new areas, including the Southeast Asian countries Cambodia, Indonesia, Taiwan, and Thailand. However, definitive and consistent evidence for the presence of these viruses still has not been reported from Africa or Australia. The occurrence of some newly recognized pathogenic Old World hantaviruses was reported (Amur virus from *Apodemus peninsulae* in the Far East and Saaremaa virus from *A. agrarius* in Europe). For the Old World, the proper taxonomy of these viruses seems to be reasonably well established. This is not the case for South American hantaviruses, presumably because rodents and their hantaviruses only recently entered the area, perhaps after the opening of the "Panama bridge", as summarized by S. Morzunov (Reno). The clinical pictures of South American hantavirus infections (D. Enria, Pergamino) seem to be variable, intermediate between severe North American hantavirus pulmonary syndrome (HPS) and Eurasian hemorrhagic fever with renal syndrome (HFRS), and include mild cases, hemorrhagic cases, and those characterized by renal and neurologic signs. Additional evidence was presented about clustered cases, suggesting person-to-person transmission in southern Argentina, Chile, and Brazil.

Transmission of hantaviruses in carrier rodents is complex and may be attributable to decreased biodiversity of rodent reservoir communities (J. Mills, Atlanta). Although it is well known that there is a correlation between wounds and infections, deer mice in laboratory colonies shed very little Sin Nombre virus. According to S. Klein (Baltimore) intact male rats shed more Seoul virus than do females or castrated males. As reported by B. Hjelle (Albuquerque), heat shock in cell cultures and cold shock *in vivo* can reactivate Sin Nombre virus, which persists in heart, lung and, interestingly, brown fat.

The pathogenesis of hantavirus infections is not well understood. Some progress was reported towards establishing reverse genetics for hantaviruses, as the catalytic core domain of Hantaan virus RNA polymerase has been isolated (C. Jonsson, Las Cruces). Also of special interest was the report by E. Mackow (Stony Brook), on the selective inhibition of □3-integrin directed endothelial cell migration by pathogenic hantaviruses. Cytotoxic T cells may also play an important role in affecting vascular permeability in HFRS and HPS (H. Van Epps and F. Ennis, Worcester). Interestingly, while HFRS caused by Puumala virus may lead to increased blood pressure (J. Mustonen, Tampere) and HPS by Sin Nombre virus to pulmonary sequelae (D. Goade, Albuquerque) as long-term effects, both HFRS and HPS can be characterized by increased proteinuria as a late consequence. Several reports on multiple cytokine mRNA and protein responses in cultured cells and in patients were, to say the least, somewhat contradictory; more work is needed to clarify these phenomena.

Classical Salk-type hantavirus vaccines have been widely and successfully used for a number of years in Korea and China. Meanwhile, more and more sophisticated recombinant and DNA vaccines are being developed in Europe and North America but none have entered the market. This work is, however, producing highly interesting results, such as the Andes virus lethal model in adult hamsters (J. Hooper, Frederick) and the recombinant human antibodies with good therapeutic potential (J. Koch, Heidelberg).

In sum, the three days in Annecy provided a comprehensive progress report of the field , one that may be summarized by Mark Twain's words "Interesting if true, interesting anyway". The participants of the conference were confident enough to found "The International Society for Hantaviruses and Hantaviral Diseases" and elected Ho Wang Lee (Seoul), the discoverer of Hantaan virus, the prototype hantavirus, as its first President.

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